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## TECHNICAL REPORT STANDARD TITLE PAGE

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		6. Performing Organization Code	
7. Author(s) Craig L. Wiegand et al.		8. Performing Organization Report No.	
9. Performing Organization Name and Address Science and Education Administration U.S. Department of Agriculture P. O. Box 267 Weslaco, TX 78596		10. Work Unit No.	
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15. Supplementary Notes			
16. Abstract  The Soil Conservation Service has consolidated soils information for the four test counties into one generalized map of 34 soil associations. The soil information has been coded into computer memory on a 20-second grid for later use in connection with HCMM data. Thirty-three areas, each approximately 30 km <sup>2</sup> , have been selected for synoptic analyses, and 18 cropland sites have been chosen for the plant water stress objective. Arrangements have been made with NOAA for access to air temperature data from an 18-station network in the test area. Potential evapotranspiration and Jensen-Haise equation soil water depletion calculations have begun--for examination in relation to observed surface heating on HCMM overpass days.			
17. Key Words (Selected by Author(s)) Heat Capacity Mapping Mission, HCMM Soil Temperature, Freeze, Water Stress, Plant Cover, Canopy Temp., Thermal Scanner, Crop Stress, Evapotranspiration		18. Distribution Statement	
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Figure 2. Technical Report Standard Title Page

## TYPE II QUARTERLY PROGRESS REPORT

March 1, 1978 to June 1, 1978

A. Problems:

Our main problem has been clouds. On all overpasses to date (May 16, May 27, June 1), we have had partly cloudy conditions.

B. Accomplishments:1. Data Handling Procedures Completeda. Soils map stored in computer.

The Soil Conservation Service (SCS) has cooperated in our objective of making soils information readily available for evaluation and correlation of HCMM data with soil conditions. Soils' information of the HCMM test site, comprising the four southmost Texas counties, was revised and consolidated to one-map-scale by the SCS. This information consisting of 34 soil associations has been coded and put into the computer on a 20-second grid.

b. Synoptic study areas selected.

Thirty-three areas of approximately 30 km<sup>2</sup> each have been selected for analyses of synoptic or gross effects in the HCMM data. These areas represent irrigated and nonirrigated agriculture, citrus, rangeland, urban, water, and bare soil in fallow season. The sites were selected on the basis of color IR aerial photography, NASA thermal scanner data, LANDSAT images, soils maps, topographic maps, and ground observations in some cases.

c. Weather station network completed.

Arrangements have been made with the Weather Service of NOAA to have access to the air temperature observations from a network of 18 measurement stations within the HCMM test site. A new weather station representative of rangeland conditions has been established for this study. Deviations of HCMM-derived surface temperatures from these air temperatures will be examined as a measure of aridity.

d. Crop water stress test sites chosen.

Examination of existing information sources on field sizes, soil types, and post-planting ground observations narrowed the suitable sites for the plant water stress objective of the investigation to 26 sites that are large enough to distinguish with HCMM data. The vegetation covers and number of sites, respectively, are: native brushland, 6; citrus, 4; cotton, 4; grain sorghum, 5; grassland or pasture, 2; and sugarcane, 5. Aerial photography of the crop sites has been acquired, and prints have been made for delineating field boundaries and aids in making and recording ground observations.

2. Procedures in Progress

a. Estimation of evapotranspiration potential.

Nine different methods reported in the literature for estimating potential evapotranspiration are being compared with actual evapotranspiration measured with an electronic weighing lysimeter. Potential evapotranspiration estimates, the day of and the day prior to HCMM overpasses, are to be related to surface heating and aridity indexes.

b. Soil profile water depletion calculations.

Work has begun on making Jensen-Haise equation soil water depletion calculations. Drying cycles begin with profile-refilling rainfall or irrigations. Thus, it is necessary to observe the fields weekly to know when the drying cycles begin. Days since irrigation or rainfall and calculated water depletion will be related to thermal responses observed with HCMM.

C. Significant Results:

None.

D. Publications:

None.

E. Recommendations:

See previous report.

F. Funds Expended:

Allotment for FY 78 - - - - -	\$45,240
Location and Indirect Program Costs -	10,604
Other costs through 5/31/78	
Salaries - - - - -	11,972
Travel & Trans. of Persons - - -	1,894
Trans. of Things - - - - -	21
Services & Supplies - - - - -	312
Equipment - - - - -	0
Total	\$24,803
Balance	\$20,437

G. Data Utility:

No new data have been received since the last report.